

WHAT IS CLAIMED IS:

1           1. An optical disk apparatus, comprising:  
2                 an optical pickup configured to irradiate an optical disk with a beam, to  
3 receive light reflected from the optical disk, and to convert the reflected light into an  
4 electrical signal;  
5                 a processor including:  
6                     a reproduction system circuit configured to generate a reproduction  
7                 signal used in restarting recording of the optical disk after an interruption, based on  
8                 the electrical signal from the optical pickup and setting values;  
9                     a speed information detection circuit configured to detect speed  
10                 information before or after an interruption of a recording on the optical disk based on  
11                 the electrical signal from the optical pickup; and  
12                 a position detection unit configured to detect a recording restart  
13                 position and a current position of the optical disk;  
14                 an accessing unit configured to control the optical pickup to access the optical  
15                 disk at the recording restart position from the current position of the optical disk; and  
16                 a setting unit configured to set in the reproduction system circuit setting values  
17                 based on the detected speed information, the setting values being used by the reproduction  
18                 system circuit to generate the reproduction signal.

1           2. The optical disk apparatus according to claim 1 wherein a recording  
2 restart speed for restarting recording is the detected speed from the speed information  
3 detection circuit.

1           3. The optical disk apparatus according to claim 1 wherein the recording  
2 restart position on the optical disk is the position on which recording occurred before the  
3 interruption at an interrupted position on the optical disk.

1           4. The optical disk apparatus according to claim 1 wherein the  
2 reproduction system circuit comprises an equalizer circuit configured to extract an  
3 information signal of the optical disk from the electrical signal sent from the optical pickup  
4 so as to perform a waveform equalization and a group delay smoothing of an EFM signal; an  
5 HPF circuit configured to suppress a fluctuation in binary voltage level of the EFM signal  
6 when a scratch passes; a binarization circuit configured to binarize the signal sent from the

7 HPF circuit; a PLL circuit configured to generate a synchronizing clock from the binarized  
8 signal; a demodulation circuit configured to convert information written on the optical disk  
9 into a digital data string by using the binarized signal and the synchronizing clock; and a  
10 scratch zone detection circuit configured to generate scratch zone information by using the  
11 information signal of the optical disk obtained by the optical pickup.

1               5. The optical disk apparatus according to claim 4 wherein the setting  
2 values comprise at least one of frequency characteristics of the equalizer circuit and the HPF  
3 circuit; response characteristics of the binarization circuit; gains of the PLL circuit and the  
4 servo circuit; and a time constant of the scratch zone detection circuit.

1               6. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit comprises a wobble signal detection circuit configured to detect  
3 a wobble signal and a wobble cycle measurement circuit configured to measure a carrier  
4 frequency of the detected wobble signal.

1               7. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit comprises a wobble signal detection circuit configured to detect  
3 a wobble signal and an ATIP cycle detection circuit configured to detect from the detected  
4 wobble signal a cycle from which ATIP address information is obtained.

1               8. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit comprises a recording synchronizing clock generation circuit  
3 configured to generate a recording synchronizing clock in response to a recording speed, and  
4 a clock cycle detection circuit configured to detect a cycle of the recording synchronizing  
5 clock generated by the recording synchronizing clock generation circuit.

1               9. The optical disk apparatus according to claim 1, further comprising a  
2 memory for storing recording speed information sent from the speed information detection  
3 circuit, wherein, if there is a recording interruption request, speed information before the  
4 recording interruption request, which is stored in the memory, is read out.

1               10. The optical disk apparatus according to claim 1, further comprising a  
2 memory for storing recording speed information sent from the speed information detection  
3 circuit, wherein, if there is a recording interruption request, speed information of a sector

4 which is a predetermined number of sectors short of the recording interruption request is read  
5 out from the memory.

1           11. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit detects speed information during a period ranging from after a  
3 recording interruption request to when the optical pickup starts accessing the sector before  
4 the interrupted position.

1           12. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit detects speed information after the optical pickup accesses to  
3 and lands on the sector before the interrupted position subsequent to a recording interruption  
4 request.

1           13. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit comprises a wobble detection circuit configured to extract a  
3 wobble signal, and a wobble cycle detection circuit configured to measure a carrier frequency  
4 of the wobble signal detected by the wobble detection circuit and detect speed information  
5 before or after an interruption of the recording on the optical disk; and wherein the position  
6 detection unit comprises an ATIP detection circuit configured to detect a current position  
7 which is used for accessing a sector before a position of the recording interruption after a  
8 recording interruption from ATIP address information indicating absolute time information of  
9 the disk based on the wobble signal obtained from the wobble detection circuit.

1           14. The optical disk apparatus according to claim 13, further comprising a  
2 memory for storing recording speed information obtained by one of the wobble cycle  
3 detection circuit and the ATIP cycle detection circuit, wherein, if there is a recording  
4 interruption request, speed information before the recording interruption request, which is  
5 stored in the memory, is read out.

1           15. The optical disk apparatus according to claim 1, wherein the speed  
2 information detection circuit comprises a wobble signal detection circuit configured to detect  
3 a wobble signal, and an ATIP cycle detection circuit configured to detect a cycle at which  
4 ATIP address information is obtained from the detected wobble signal to detect speed  
5 information before or after an interruption of the recording on the optical disk; and wherein  
6 the position detection unit comprises an ATIP detection circuit configured to detect a current  
7 position which is used for accessing a sector before a position of a recording interruption

8 after the recording interruption from ATIP address information indicating absolute time  
9 information of the disk based on the wobble signal obtained from the wobble detection circuit.

1           16. An optical disk apparatus, comprising:

2           an optical pickup configured to irradiate an optical disk with a beam, to  
3 receive light reflected from the optical disk, and to convert the reflected light into an  
4 electrical signal;

5           a processor including:

6           a reproduction system circuit configured to generate a reproduction  
7 signal used in restarting recording of the optical disk after an interruption, based on  
8 the electrical signal from the optical pickup and setting values;

9           a recording synchronizing clock generation circuit configured to  
10 generate a clock in response to a recording speed of a recording by irradiating a beam  
11 on the optical disk;

12           a clock cycle detection circuit configured to detect a cycle of the  
13 recording synchronizing clock generated by the recording synchronizing clock  
14 generation circuit to detect speed information before or after an interruption of the  
15 recording on the optical disk; and

16           a position detection unit configured to detect a recording restart  
17 position and a current position of the optical disk;

18           an accessing unit configured to control the optical pickup to access the optical  
19 disk at the recording restart position from the current position; and

20           a setting unit configured to set in the reproduction system circuit setting values  
21 based on the detected speed information, the setting values being used by the reproduction  
22 system circuit to generate the reproduction signal.

1           17. An optical disk recording method comprising:

2           interrupting a recording on an optical disk in response to a recording  
3 interruption request;

4           detecting a recording speed set before or after interrupting the recording;

5           setting one or more parameters for a predetermined circuit based on the  
6 detected recording speed;

7           detecting position information for accessing a sector before a recording

8 interrupted position;

9                   accessing the sector before the recording interrupted position;  
10                  detecting the recording interrupted position; and  
11                  restarting recording from the recording interrupted position based on the one  
12                  or more parameters set for the predetermined circuit.

1                   18.       The optical disk recording method according to claim 17, wherein  
2                  detecting the recording speed includes a step of reading out speed information before the  
3                  recording interruption request.

1                   19.       The optical disk recording method according to claim 17, wherein  
2                  detecting the recording speed includes a step of reading out speed information of a sector  
3                  which is a predetermined number of sectors short of the recording interrupted request.

1                   20.       The optical disk recording method according to claim 17, wherein  
2                  detecting the recording speed includes a step of reading out speed information during a period  
3                  ranging from after the recording interruption request to when the optical pickup starts  
4                  accessing the sector before the interrupted position.

1                   21.       The optical disk recording method according to claim 17, wherein  
2                  detecting the recording speed includes a step of reading out speed information after the  
3                  optical pickup accesses to and lands on the sector before the interrupted position subsequent  
4                  to the recording interruption request.